

**SURFACE PLASMON AMPLIFICATION
BY STIMULATED EMISSION OF RADIATION**

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Abstract of the Disclosure

A nanostructure is used to generate a highly localized nanoscale optical field. The field is excited using surface plasmon amplification by stimulated emission of radiation (SPASER). The SPASER radiation consists of surface plasmons that undergo stimulated emission, but in contrast to photons can be localized within a nanoscale region. A SPASER can incorporate an active medium formed by two-level emitters, excited by an energy source, such as an optical, electrical, or chemical energy source. The active medium may be quantum dots, which transfer excitation energy by radiationless transitions to a resonant nanosystem that can play the same role as a laser cavity in a conventional laser. The transitions are stimulated by the surface plasmons in the nanostructure, causing the buildup of a macroscopic number of surface plasmons in a single mode.

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